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EXAMINER
MONIKANG, GEORGE C

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>21 April 2009</u>.
2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-22</u> is/are pending in the application.
   4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) <u>1,4-6 and 11-22</u> is/are rejected.
7) ☒ Claim(s) <u>2-3, 7-10</u> is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a) ☒ All b) ☐ Some * c) ☐ None of:
       1. ☐ Certified copies of the priority documents have been received.
       2. ☒ Certified copies of the priority documents have been received in Application No. <u>10/535,524</u>.
       3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments filed 4/21/2009 have been fully considered but they are

not persuasive.

2.   With respect to applicant's arguments that the Sibbald reference fails to disclose

sound components expressed in a base spherical harmonics, the examiner maintains

his stand. Sibbald discloses near-field effects being calculated using spherical co-

ordinates (base of spherical harmonics) (*Sibbald, col. 8, lines 30-43*) between a sound

source (i.e. speaker is a playback device) and a user's head (*Sibbald, col. 3, line 56

through col. 4, line 11*).

3.   With regards to applicant's arguments that the Sibbald reference does not

disclose the filtering being dependent on a distance between a playback device and a

reference point (i.e. listener's head). The examiner maintains his stand. The Sibbald

reference discloses obtaining filter coefficients that are dependent on a distance

between a sound source (i.e. loudspeaker playback device) and a listener's head

(reference point) (*Sibbald, col. 3, line 56 through col. 4, line 11*).

4.   This action is non-final due to examiner's change of grounds for rejection.

Claim Rejections - 35 USC § 102

5.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

        A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by
another filed in the United States before the invention by the applicant for patent or (2) a patent
granted on an application for patent by another filed in the United States before the invention by the
applicant for patent, except that an international application filed under the treaty defined in section
351(a) shall have the effects for purposes of this subsection of an application filed in the United States
only if the international application designated the United States and was published under Article 21(2)
of such treaty in the English language.

6.   Claims 1, 4-5, 11, 13-16, 18 & 21-22 is rejected under 35 U.S.C. 102(e) as being

anticipated by Sibbald et al, US Patent 7,167,567 B1.

Re Claim 1, Sibbald et al discloses a method of processing sound data, wherein,

before a playback of the sound by a playback device: a) signals representative of at

least one sound propagating in a three-dimensional space (_col. 4, lines 15-29_) and

arising from a source situated at a first distance from a reference point are coded so as

to obtain a representation of the sound by components expressed in a base of spherical

harmonics of origin corresponding to said reference point (_col. 3, line 56 through col. 4,_

line 11: filter coefficients are dependent on a distance between a sound source (i.e.

loudspeaker playback device) and a listener's head (reference point) are calculated at a

second distance of 1 meter; col. 8, lines 30-43: near-field effects being calculated using

spherical co-ordinates), b) and a compensation of a near field effect is applied to said

components by a filtering which is dependent on a second distance defining

substantially, for a playback of the sound by said playback device, a distance between a

playback point and a point of auditory perception (_col. 3, line 56 through col. 4, line 11:_

filter coefficients are dependent on a distance between a sound source (i.e. loudspeaker

playback device) and a listener's head (reference point) are calculated at a second

distance of 0.9 meter).

Re Claim 4, sibbald et al discloses the method as claimed in claim 1, wherein the data coded and filtered in steps (*col. 3, line 56 through col. 4, line 11*) a) and b) are transmitted to a parameter representative of said second distance (*col. 3, line 56 through col. 4, line 11*).

Re Claim 5, Sibbald et al discloses the method as claimed in claim 1 wherein, the data coded and filtered in steps (*col. 3, line 56 through col. 4, line 11*) a) and b) are stored with a parameter representative of said second distance on a memory medium intended to be read (*col. 3, line 56 through col. 4, line 11*).

Re Claim 11, Sibbald et al discloses the method as claimed in claim 1 wherein there is provided a microphone comprising an array of acoustic transducers arranged substantially on the surface of a sphere whose center corresponds substantially to said reference point (*col. 1, lines 22-38*), so as to obtain said signals representative of at least one sound propagating in the three-dimensional space (*col. 4, lines 15-29*).

Re Claim 13, Sibbald et al discloses the method as claimed in claim 11 wherein there is provided a number of transducers that depends on a total number of components chosen to represent the sound in said base of spherical harmonics (*col. 3, line 56 through col. 4, line 11*).

Re Claim 14, Sibbald et al discloses the method as claimed in claim 1, in which in step a) a total number of components is chosen from the base of spherical harmonics so as to obtain (*col. 3, line 56 through col. 4, line 11*), a region of the space around the point of perception in which the sound is faithful and whose dimensions are increasing with the total number of components (*col. 3, line 56 through col. 4, line 11*).

Re Claim 15, Sibbald et al discloses the method as claimed in claim 14, wherein there is provided a playback device comprising a number of loudspeakers at least equal to said total number of components (*col. 3, line 56 through col. 4, line 11*).

Re Claim 16, sibbald et al discloses the method as claimed in claim 1 wherein: there is at least a first and a second loudspeaker disposed at a chosen distance from a listener (*col. 3, line 56 through col. 4, line 11*), a cue of awareness of the position in space of sound sources situated at a predetermined reference distance from the listener is obtained for this listener (*col. 3, line 56 through col. 4, line 11*), and the compensation of step b) is applied with said reference distance substantially as second distance (*col. 3, line 56 through col. 4, line 11*).

Re Claim 18, Sibbald et al discloses the method as claimed in claim 16, wherein: comprises a headset with two headphones for the respective ears of the listener (*col. 4, lines 30-50*), and separately for each headphone, the coding and the filtering of steps a) and b) are applied with regard to respective signals intended to be fed to each headphone (*col. 4, lines 30-50*), with, as first distance, respectively a distance separating each ear from a position of a source (*col. 3, line 56 through col. 4, line 11*).

Re Claim 21, Sibbald et al discloses a sound acquisition device, comprising a microphone furnished with an array of acoustic transducers disposed substantially on the surface of a sphere (*col. 3, line 56 through col. 4, line 11*), wherein the device furthermore comprises a processing unit arranged so as to: receive signals each emanating from a transducer, apply a coding to said signals so as to obtain a representation of the sound by components expressed in a base of spherical harmonics

(*col. 3, line 56 through col. 4, line 11*), of origin corresponding to the center of said

sphere, and apply a filtering to said components, which filtering is dependent (*col. 3, line*

56 through col. 4, line 11), on the one hand, on a distance corresponding to the

reference distance (*claim 5*).

      Re Claim 22, Sibbald et al discloses the device as claimed in claim 21, wherein

said filtering consists, on the one hand, in equalizing (*para 0079*), as a function of the

radius of the sphere, the signals arising from the transducers so as to compensate for a

weighting of directivity of said transducers and (*col. 3, line 56 through col. 4, line 11:*

filter coefficients are dependent on a distance between a sound source (i.e. loudspeaker

playback device) and a listener's head (reference point) are calculated at a second

distance of 1 meter; col. 8, lines 30-43: near-field effects being calculated using

spherical co-ordinates), on the other hand, in compensating for a near field effect as a

function of a chosen reference distance (*claim 5*), defining substantially, for a sound, a

distance between a playback point and a point of auditory perception (*col. 3, line 56*

through col. 4, line 11: filter coefficients are dependent on a distance between a sound

source (i.e. loudspeaker playback device) and a listener's head (reference point) are

calculated at a second distance of 0.9 meter).

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

2.   Claims 6, 12 & 17 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Sibbald et al, US Patent 7,167,567 B1.

Re Claim 6, Sibbald et al discloses the method as claimed in claim 4, in which,

prior to a sound playback by a playback device comprising a plurality of loudspeakers

disposed at a third distance from said point of auditory perception (*col. 3, line 56*

through col. 4, line 11), a filter whose coefficients are dependent on said second and

third distances is applied to the coded and filtered data (*col. 3, line 56 through col. 4,*

line 11).

However, Sibbald et al fails to disclose the filter being an adaptive filter. Official

notice is taken that both the concepts and advantages of providing an adaptive filter are

well known in the art. Thus it would have been obvious to use an adaptive filter since

they are commonly used to self adjust transfer functions according to optimizing

algorithm.

Claims 12 & 17 have been analyzed and rejected according to claim 6.

Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Sibbald et al, US Patent 7,167,567 B1 as applied to claim 1 above, in view of Jot et al,

US Patent 7,231,054 B1.

Re Claim 19, Sibbald et al discloses the method as claimed in claim 1, but fails to

disclose wherein a matrix system is fashioned (*Jot et al, col. 9, lines 22-53*), in steps a)

and b), said system comprising at least: a matrix comprising said components in the

base of spherical harmonics (*Jot et al, col. 9, lines 22-53*), and a diagonal matrix whose

coefficients correspond to filtering coefficients of step b) (*Jot et al, col. 9, lines 22-53*),

and said matrices are multiplied to obtain a result matrix of compensated components

(*Jot et al, col. 9, lines 22-53*) as taught in Jot et al. It would have been obvious to modify

the method of processing sound data with matrices of spherical harmonics as taught in

Jot et al (*Jot et al, col. 9, lines 22-53*) for the purpose of finding a set of complex scalars

for a given frequency.

Claim 20 has been analyzed and rejected according to claim 19.

Allowable Subject Matter

1.   Claims 2-3, 7-10 are objected to as being dependent upon a rejected base claim,

but would be allowable if rewritten in independent form including all of the limitations of

the base claim and any intervening claims.

2.   The following is a statement of reasons for the indication of allowable subject

matter for claims 2-3, 7-10 the prior art does not teach or moderately suggest the

following limitations:

Wherein, said source being far removed from the reference point: components of successive orders m are obtained for the representation of the sound in said base of spherical harmonics, and a filter is applied, the coefficients of which, each applied to a component of order m, are expressed analytically in the form of the inverse of a polynomial of power m, whose variable is inversely proportional to the sound frequency and to said second distance, so as to compensate for a near field effect at the level of the playback device.

Limitations such as these may be useful in combination with other limitations of claim 1.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GEORGE C. MONIKANG whose telephone number is (571)270-1190. The examiner can normally be reached on M-F. alt Fri. Off 7:30am-5:00pm (est).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

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you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/George C Monikang/   7/17/2009
Examiner, Art Unit 2614

                                   /Vivian Chin/
                    Supervisory Patent Examiner, Art Unit 2614